

WHAT IS CLAIMED IS:

1. A method for fabricating a detector assembly, said method comprising:

positioning a first scintillator array on a first side of a flexible member;

and

positioning a first collimator array on a second side of the flexible member.

2. A method in accordance with Claim 1 further comprising positioning a second scintillator array on the first side of the flexible member with an alignment tool comprising a body with at least two alignment datums extending therefrom, wherein each of the first and second scintillator arrays comprises at least one alignment datum.

3. A method in accordance with Claim 2 further comprising positioning a second collimator array on the second side of the flexible member with the alignment tool, wherein each of the first and second collimator arrays comprises at least one alignment datum.

4. A method in accordance with Claim 1 further comprising positioning a second collimator array on the second side of the flexible member with an alignment tool comprising a body with at least two alignment datums extending thereon, wherein each of the first and second collimator arrays comprises at least one alignment datum.

5. A method in accordance with Claim 1 further comprising:

bending the flexible member into an arc; and

positioning the bent flexible member to receive radiation from a radiation source.

6. A method in accordance with Claim 1 wherein said positioning a first scintillator array comprises positioning the first scintillator array on a first side of a flexible member comprising graphite.

7. A method for fabricating a detector array, said method comprising:

providing a plurality of diode assemblies each comprising at least one alignment datum;

providing a plurality of scintillator packages each comprising at least one alignment datum;

providing a plurality of collimator arrays each comprising at least one alignment datum; and

optically coupling each diode assembly with one respective scintillator package and one respective collimator array by aligning the alignment datums of the respective diode assembly, scintillator package, and collimator array.

8. A method in accordance with Claim 7 further comprising:

providing a flexible member;

positioning the diode assemblies and the scintillator packages on a first side of the flexible member; and

positioning the collimator array on a second side of the flexible member.

9. A method in accordance with Claim 8 wherein said optically coupling each diode assembly with one respective scintillator package and one respective collimator comprises optically coupling a first diode assembly with a first scintillator package and a first collimator array by aligning the alignment datums of the first diode assembly, first scintillator package, and first collimator array to form a

first detector module, and using an alignment tool comprising a body with at least two alignment datums extending thereon to position at least one of a second diode assembly, a second scintillator package, and a second collimator array on the flexible member.

10. A method in accordance with Claim 7 wherein said optically coupling each diode assembly with one respective scintillator package and one respective collimator comprises optically coupling a first diode assembly with a first scintillator package and a first collimator array by aligning the alignment datums of the first diode assembly, first scintillator package, and first collimator array to form a first detector module, and using an alignment tool comprising a body with at least two alignment datums extending thereon to position at least one of a second diode assembly, a second scintillator package, and a second collimator array.

11. A method of replacing a detector module in a modular detector assembly including at least one existing module including an alignment datum, said method comprising:

removing a module to be replaced from the assembly;

providing a replacement module comprising at least one alignment datum; and

using an alignment tool comprising a body with at least two alignment datums extending thereon to position the replacement module in the assembly with respect to the existing module.

12. A method for fabricating a plurality of detector assemblies, said method comprising:

providing a plurality of diode assemblies each comprising at least one alignment datum;

providing a plurality of scintillator packages each comprising at least one alignment datum;

providing a plurality of collimator arrays each comprising at least one alignment datum;

optically coupling each diode assembly with one respective scintillator package and one respective collimator array by aligning the alignment datums of the respective diode assembly, scintillator package, and collimator array to form a plurality of detector modules;

positioning N detector modules on a first member to form a first detector assembly; and

positioning M detector modules on a second member to form a second detector assembly, wherein M is not equal to N and the first and second detector assemblies are different sized.

13. A detector assembly comprising:

a flexible member comprising a first side and a second side;

a first scintillator array positioned on said first side of said flexible member; and

a first collimator array positioned on said second side of said flexible member, said collimator optically coupled to said scintillator array.

14. An assembly in accordance with Claim 13 further comprising:

a second scintillator array positioned on said first side of said flexible member, said first and second scintillators each comprising an alignment datum, said first and second scintillators' alignment datums separated by a distance D; and

a second collimator array positioned on said second side of said flexible member, said first and second collimators each comprising an alignment datum; said first and second collimators' alignment datums separated by the distance D.

15. An assembly in accordance with Claim 13 wherein said flexible member bent in an arc.

16. An assembly in accordance with Claim 13 wherein said flexible member comprises graphite.

17. A detector assembly comprising :

a diode assembly comprising at least one alignment datum;

a scintillator package comprising at least one alignment datum; and

a collimator array comprising at least one alignment datum aligned with said diode assembly alignment datum and said diode assembly alignment datum, wherein said diode assembly, said scintillator package, and said collimator are optically coupled.

18. An assembly in accordance with Claim 17 wherein said diode assembly comprises two alignment datums on opposing ends.

19. An assembly in accordance with Claim 18 wherein each said scintillator package and said collimator array comprises two alignment datums on opposing ends of both said scintillator package and said collimator array.

20. An imaging system comprising:

a radiation source;

a computer operationally coupled to said radiation source; and

a radiation detector assembly operationally coupled to said computer, said detector assembly comprising:

a diode assembly comprising at least one alignment datum;

a scintillator package comprising at least one alignment datum; and

a collimator array comprising at least one alignment datum aligned with said diode assembly alignment datum and said diode assembly alignment datum, wherein said diode assembly, said scintillator package, and said collimator are optically coupled.

21. An imaging system in accordance with Claim 20 wherein said radiation detector is an x-ray detector and further comprises a flexible member, wherein said scintillator package and said diode assembly positioned on a first side of said flexible member, and said collimator array positioned on a second side of said flexible member.